



# VIRGINIA

## COVID-19 Update July 1<sup>st</sup>, 2021

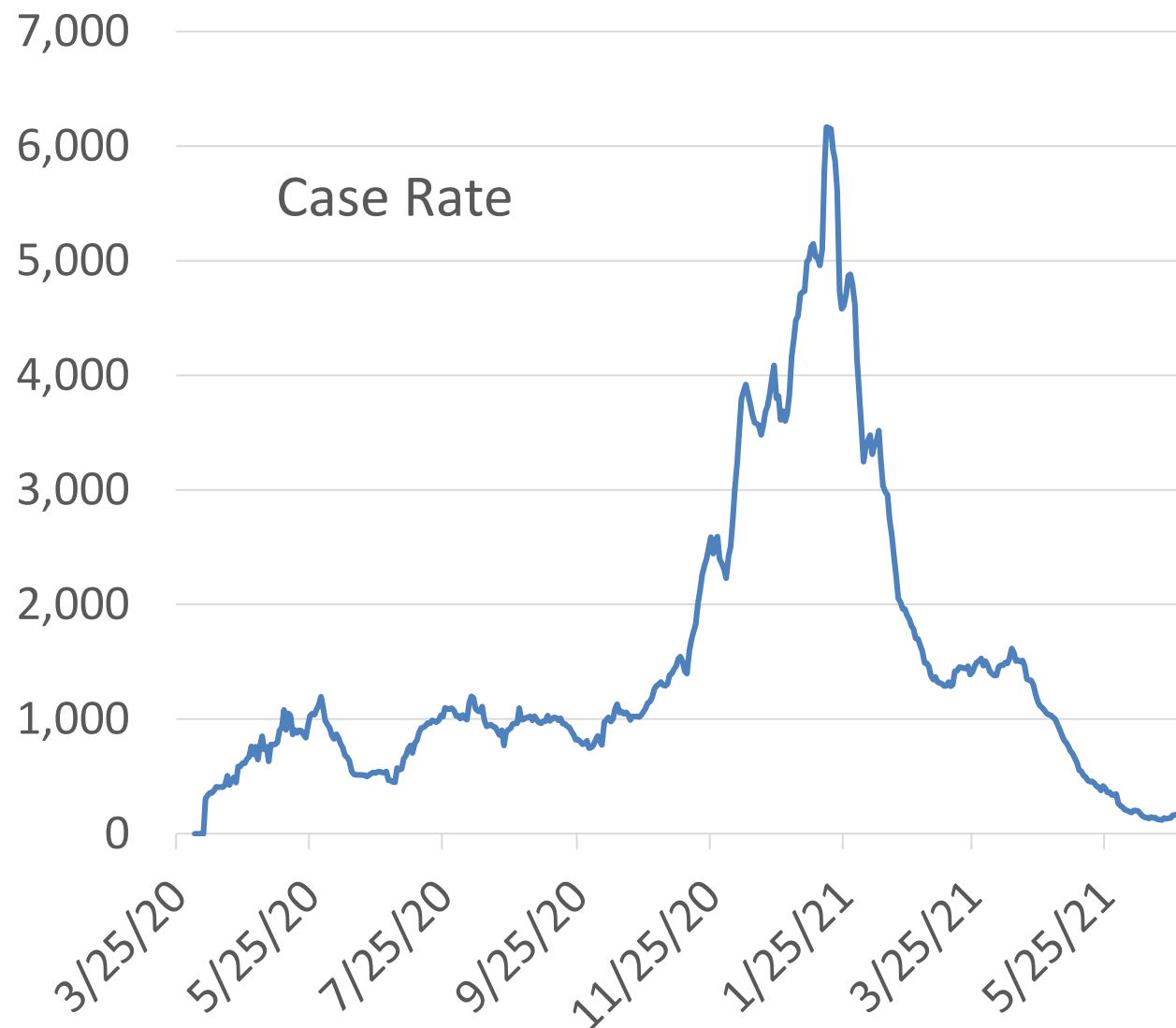
Carter C. Price, Ph.D.

A team of RAND researchers was asked by the Commonwealth of Virginia to review available information on COVID-19 models of the Commonwealth to determine the strengths and weaknesses of each model and their relevance to decisionmaking. The information in this presentation is intended to keep policymakers abreast of the latest findings of the research team.

This research was sponsored by the Commonwealth of Virginia and conducted by the RAND Corporation. RAND is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest. For more information, visit [www.rand.org](http://www.rand.org).



# Bottom Line Up Front



**Confirmed cases** have risen from last week to 165 per day (+20%)

- This is 87 percent lower than the mid-March low of 2021 and 63 percent below the summer lows of 2020

**COVID hospitalizations** have leveled off at 264 (+2%)

**Vaccination** is continuing to increase with at least 51 percent of the population fully vaccinated

- With the current trends, community immunity from vaccination will not be reached statewide before the fall

**Case rates are below the lows of 2020, but progress has stalled**

- The pandemic is not over, but many parts of Virginia are ready to enter the recovery phase, which entails activities to promote the return to normal
- Given the continued threat of COVID variants, preparation activities for future phases should be ongoing

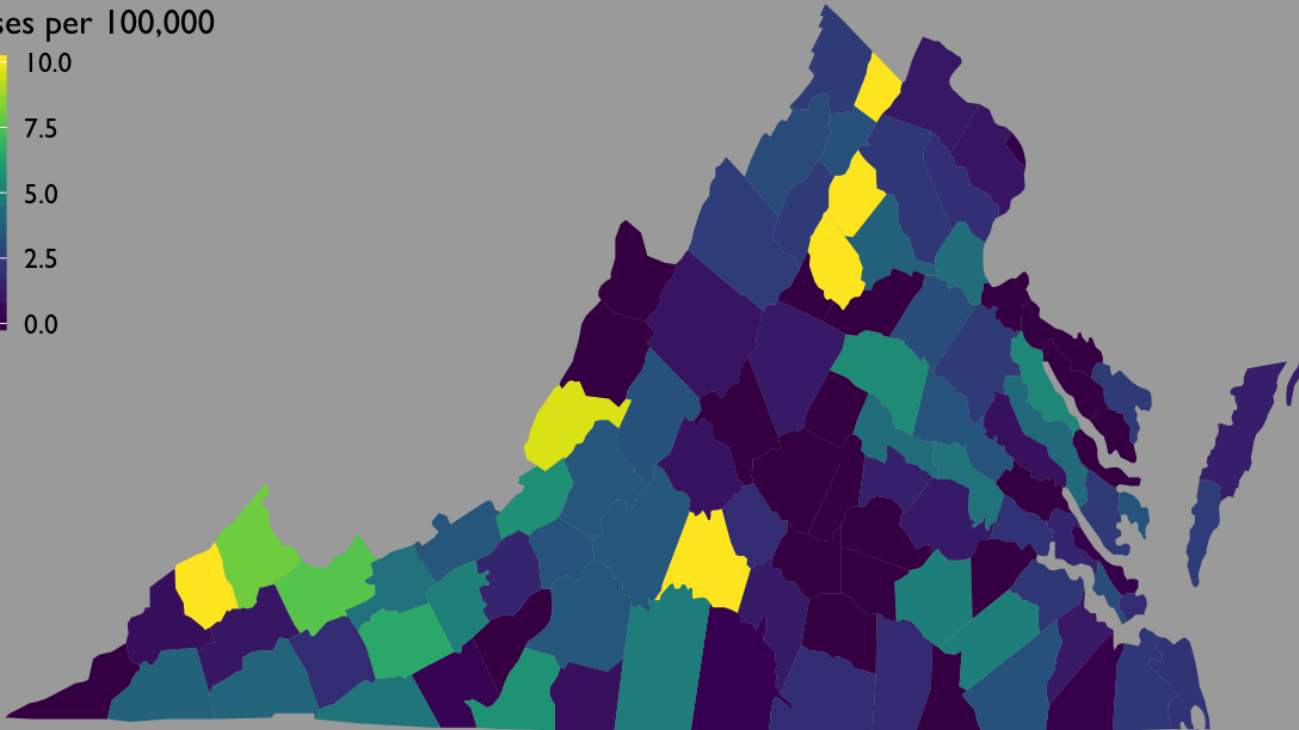
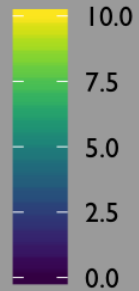


# Cases are relatively low across the Commonwealth

## CASE COUNT

Source: VDH

Cases per 100,000



**Yellow** indicates at least 10 cases per 100,000

## Case levels have remained low across the Commonwealth

- 6 percent of counties have more than 10 cases per 100,000 (139,000 Virginians live in these counties)
- 86 percent of counties have fewer than 5 cases per 100,000 (8,154,000 Virginians live in these counties)

**When cases are this low, even the weekly values can be volatile**

These data were updated June 30<sup>th</sup> and represent a seven-day average of the previous week

# Case levels for neighboring states remain low

Over the last 7 days, Virginia had 1.9 new confirmed cases per day per 100,000 (+20% from last week)

**Very high case loads (>20):**

**High case loads (10-20):**

**Lower case loads (<10): None**

- North Carolina (3.2 new cases per 100k, +18% from last week)
- West Virginia (3.1, -9%)
- Kentucky (3.1, -9%)
- District of Columbia (1.4, -14%)
- Tennessee (1.2, -60%)
- Maryland (0.9, -38%)

These data were updated June 30<sup>th</sup> and represent a seven-day average of the previous week



# Variants could increase the rate of spread

**The CDC has identified five variants of concern that spread more rapidly than the baseline variant and may lead to more reinfection**

- All five variants of concern have been detected in Virginia

**The CDC has projections of the June 29<sup>th</sup> prevalence for HHS Region 3 (DE, DC, MD, PA, VA, and WV) based on genomic testing from June 6<sup>th</sup> to June 19<sup>th</sup>**

- B.1.1.7 (“U.K. variant” or “Alpha”) is estimated to be 60.3 percent of cases in the region
- B.1.617.1-3 (“Indian variants” or “Delta”) are estimated to be 14.6 percent of the cases in the region
- P.1 (“Brazilian variant” or “Gamma”) is estimated to be 6.1 percent of cases
- B.1.351 (“South African variant” or “Beta”) is estimated to be 0.6 percent of cases

**Additionally, there are several variants of interest that have been detected in the region**

- B.1.526/B.1.526.1 /B.1.526.2 (“New York variants”) are estimated to total 13.2 percent



# 51 percent of Virginians are fully vaccinated, and an additional 8 percent are partially vaccinated

Age	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+	Total*
Fully Vaccinated	0	308,722	500,806	575,106	606,027	706,907	713,429	483,040	229,234	4,326,828
% Full	0.0%	28.1%	43.4%	49.0%	56.3%	62.8%	73.0%	78.7%	73.6%	50.7%
Partially Vaccinated	0	98,377	103,638	103,746	96,404	102,054	90,532	54,373	30,061	701,518
% with Partial	0.0%	8.9%	9.0%	8.8%	9.0%	9.1%	9.3%	8.9%	9.7%	8.2%
Confirmed Cases	32,903	74,718	131,328	110,923	99,463	97,299	66,116	35,458	25,078	680,340
% Confirmed Cases	3.3%	6.8%	11.4%	9.5%	9.2%	8.6%	6.8%	5.8%	8.1%	8.0%

\*The total includes those without reported age information

Source: VDH, June 30<sup>th</sup>

## Vaccinations have slowed substantially from the peak

- Over the last seven days, Virginia has averaged 16,045 doses per day (-27% from last week and -79% from April)
- At this pace, the vaccination levels needed for community immunity will not be reached across the Commonwealth before September of 2021

## A Kaiser Family Foundation poll from June 30<sup>th</sup> indicated hesitancy has continued to decline

- There is a small but consistent portion of the population resistant to receiving a vaccine (roughly 20 percent)
- Half of adults are in a fully vaccinated household and one quarter are in a fully unvaccinated household
- Half of the unvaccinated adults report that there is no need to be vaccinated because the case rates are so low
- The most common reason people provide for being hesitant is that the vaccine is too new

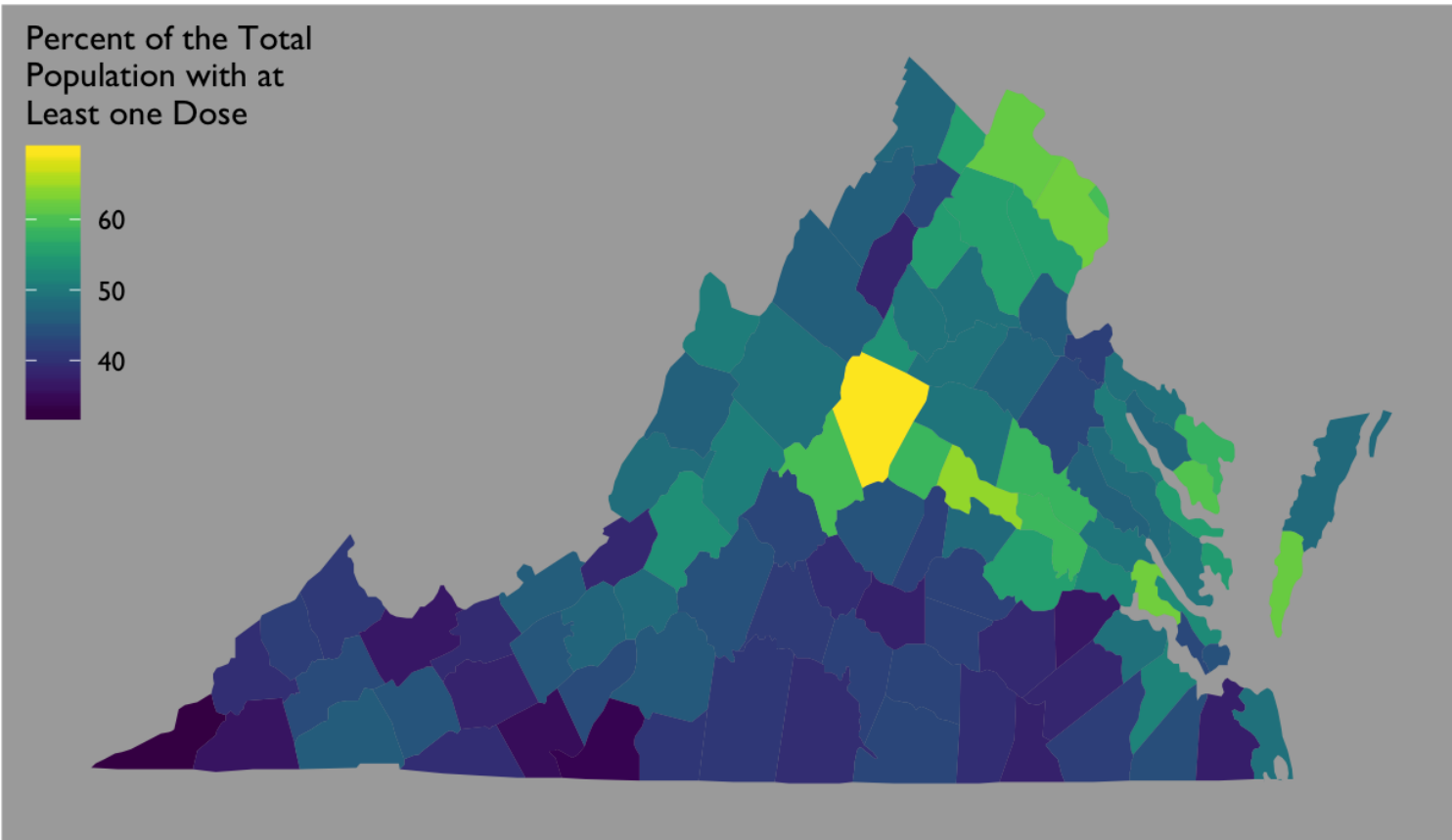




# Vaccination rates are uneven across the Commonwealth

## Share of the Total Population with at Least One Dose

Source: VDH



These data were updated June 30<sup>th</sup>

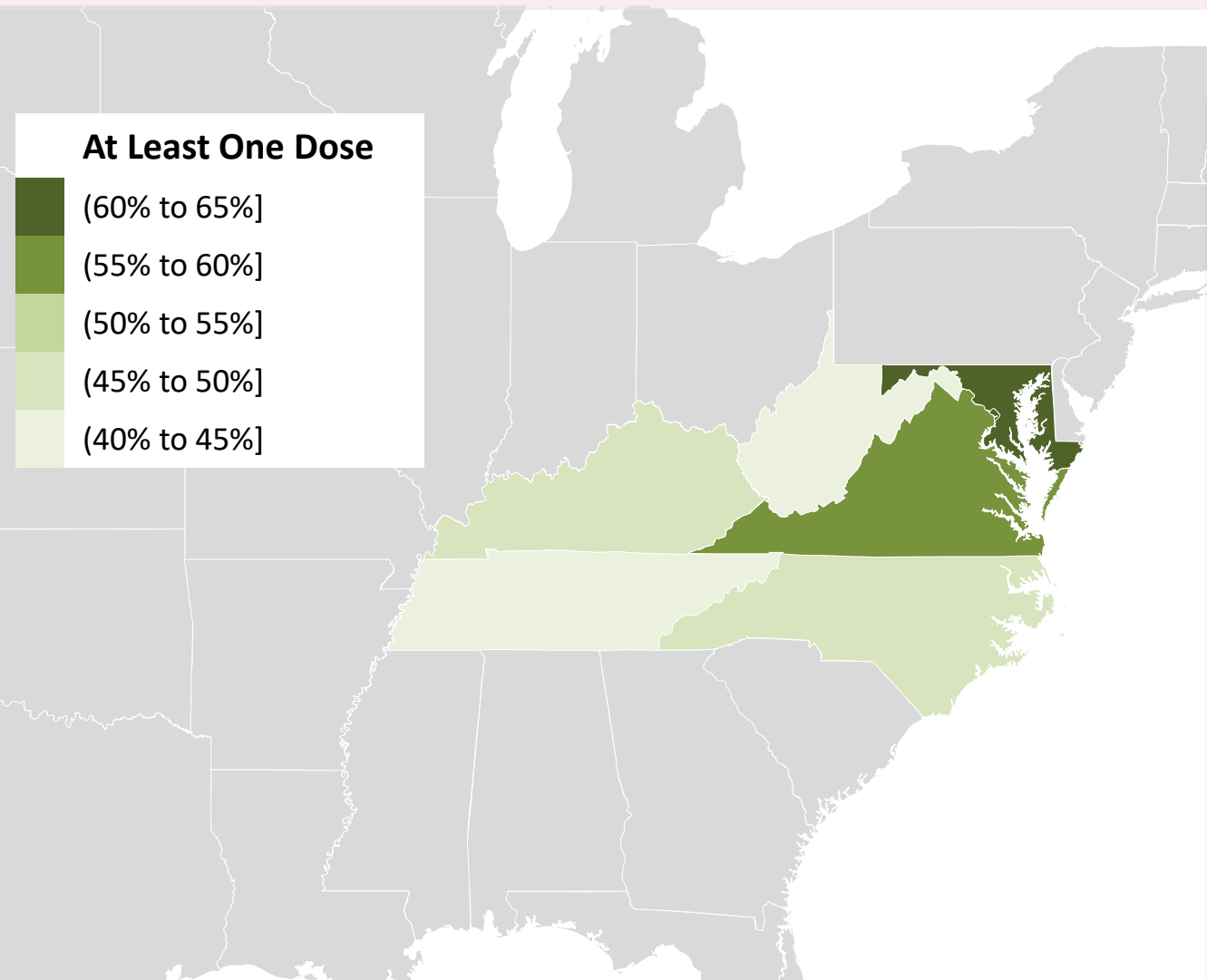
## The population with at least one dose varies by county

- 40 counties (4.2 million Virginians) have more than 50 percent of their total population vaccinated (up from 39 counties and 4.2 million Virginians)
- 24 counties (878,000 Virginians) have less than 40 percent of their total population vaccinated (down from 25 counties and 930,000 Virginians)

**Community immunity is estimated to require a vaccination rate around 70 to 80 percent for the total population**



# Vaccination rates among neighboring states vary substantially



	Partially Vaccinated*	Fully Vaccinated*
<b>Nationwide</b>	<b>7.8%</b>	<b>46.4%</b>
D.C.	9.0%	52.1%
Kentucky	6.0%	43.4%
Maryland	5.9%	55.9%
North Carolina	6.0%	39.2%
Tennessee	6.3%	35.3%
<b>Virginia**</b>	<b>7.2%</b>	<b>51.7%</b>
West Virginia	6.5%	37.1%

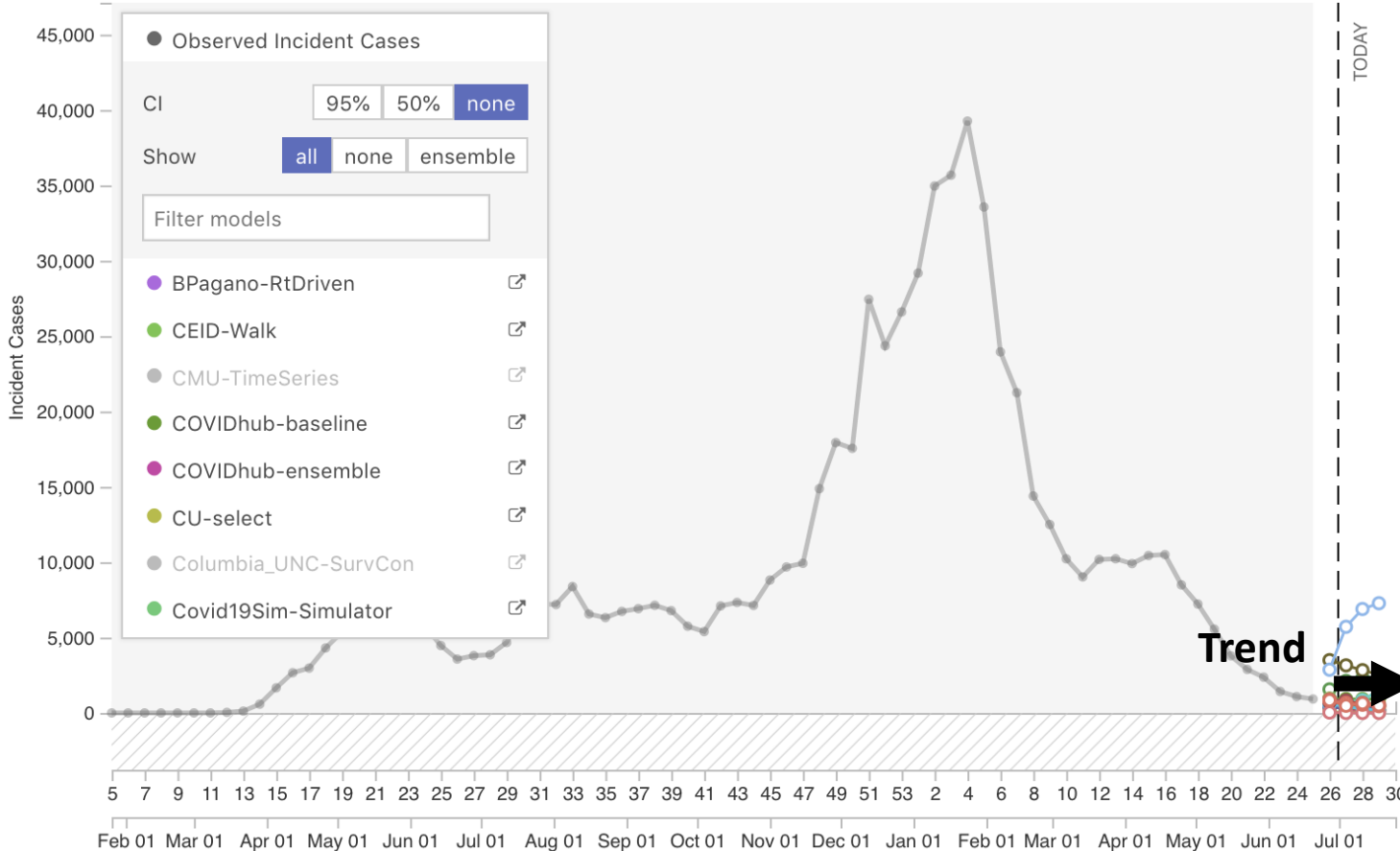
\* Total population, includes out-of-state vaccinations  
\*\*Differs from previous slide because all vaccination sources (e.g., federal) are included

Source: <https://covid.cdc.gov/covid-data-tracker/#vaccinations>

These data were updated June 30<sup>th</sup>



# The model forecasts broadly agree on a flattening



Source: COVID-19 Forecast Hub, <https://viz.covid19forecasthub.org/>  
Accessed June 30<sup>th</sup>

## The model estimates forecast a flattening in cases over the coming weeks

- A few models are predicting increases in cases over the next couple of weeks

## Many of the model predictions lag the data

- This means that they match the trends in retrospect but not as forecasts

## Modeling will be less useful for forecasts with the current decline in cases

- Surveillance efforts will be key to the early identification of potential outbreaks
- Contact tracing efforts have proven effective in containing low levels of spread
- Modeling can support both surveillance and test-and-trace



# We've been monitoring recent, relevant literature



## **Li et al. modeled the spread associated with outbreaks of new variants for scenarios with different levels of vaccination**

- The authors found that a hypothetical variant that reduces the efficacy of vaccinations from around 90 percent to 75 or 50 percent could result in 30 percent or 230 percent more cases over the next year, respectively
- The number of deaths is similarly distributed
- This assumes that new pandemic controls are not put in place, but highlights how modeling can be useful going forward



## **O'Brien and Clements identified early warning signals from the initial and secondary waves of COVID in the UK that could be used to flag risks for future waves**

- Using case data, the authors estimate that waves could be predicted 14 to 29 days in advance



## **Agarwal et al. used COVID case counts, policy responses, and aggregate mortality data to assess whether shelter-in-place responses reduce overall mortality**

- The authors used data from 43 countries and all 50 states to explore the trends before the implementation of a shelter-in-place order and in the weeks following such an order for their analysis
- They found that shelter-in-place orders were not effective in reducing deaths, but this could have been due to the individual responses proceeding official reactions to the pandemic
- The authors could not assess the longer-term effects of shelter-in-place orders



# What should we look out for in the next few months?

**We expect to see a continued decline in cases in Virginia, but there are some things that could change**

**Summer travel (early July to early September) could lead to increases in cases**

- Last year, cases grew rapidly in the Southeast in early July and cases in other parts of the Commonwealth rose in subsequent months

**A hurricane (late August to October) that causes evacuations could increase the spread both in the affected areas and areas receiving evacuees**

- The hurricane return periods for Virginia's coastline range from 13- to 15-years and a hurricane could be a major disruption for the Central, Eastern, Hampton Roads, and Northern Regions
- A hurricane that made landfall in North Carolina (return periods range from 5- to 7-years) would be more likely to affect the Southside and Central Regions

**Future variants could bypass natural or vaccine-acquired immunity**

- At this point in time, the vaccines appear to protect against the variants of interest and concern

**These risks are not uniformly spread by geography or demographics**

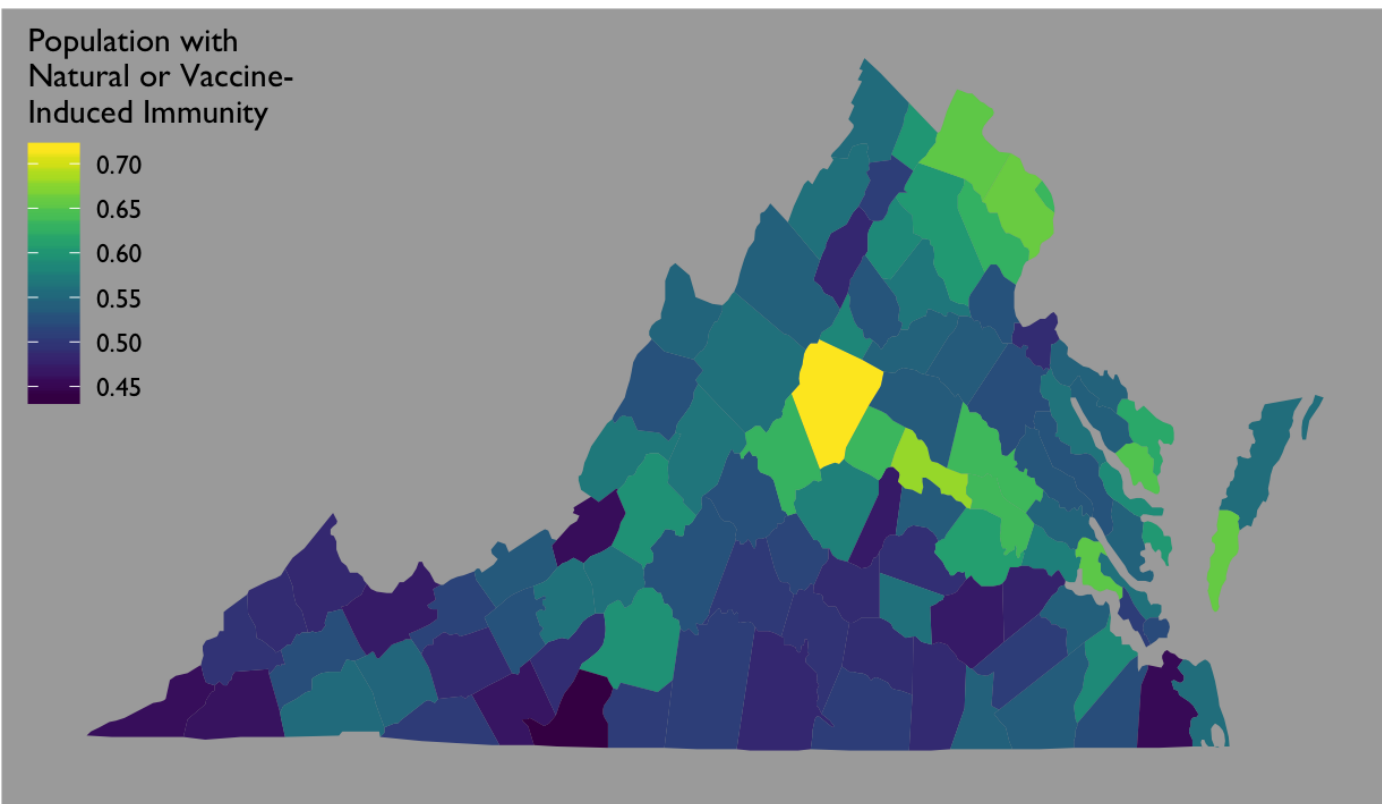
- Immunity is lower in the southern counties and among younger people



# Immunity can be gained by prior infection or vaccination

## Estimated Share of the Total Population with Immunity from at Least One Dose or Prior Infection

Source: VDH




These data were updated June 30<sup>th</sup>

**These estimates are based on VDH case data and vaccination rates**

- This assumes people with a prior COVID infection are equally likely to get vaccinated

**The distribution of immunity is more evenly distributed than the vaccination levels because vaccination levels are negatively correlated with cases**

- 64 percent of the total population has some level of immunity
- The county level of immunity ranges from 44 percent to 73 percent



# Discussion and Questions